

Form PTO-1449	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO. VT-2084CON	SERIAL NO. 09/936,675	MB 0651-0031
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		APPLICANT Barker		
Sheet Page 1 of 1		FILING DATE 3/13/02	GROUP 1745	

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REF. NO.	DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	LOCATION WHERE RELEVANT PASSAGES OR FIGURES APPEAR	RELEVANT FIGURES
CL		US 5721070 B1	2/24/98	Shackle		

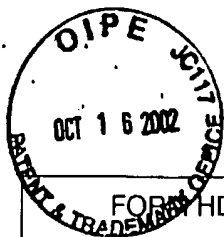
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EXAMINER INITIALS	REF. NO.	

EXAMINER <i>Carol Chaney</i>	DATE CONSIDERED <i>10-18-04</i>
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Sheet 1 of 5

ATTORNEY DOCKET NO.

SERIAL NO.

4858-000080 USB

09/936,675

APPLICANT

Jeremy Barker

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U.S. PATENT DOCUMENTS

Ref. Desig.	Examiner's Initials	Document Number	Date	Name	Class/ Subclass	(If appropriate) Filing Date
1.	ce	3,736,184	5/29/73	Dey et al.		
2.		4,009,092	2/22/77	Taylor		
3.		4,049,891	9/20/77	Hong et al		
4.		4,098,687	7/4/78	Yang		
5.		4,166,159	8/28/79	Pober		
6.		4,194,062	3/18/80	Carides et al.		
7.		4,322,485	3/30/82	Harrison et al.		
8.		4,394,280	7/19/83	von Alpen et al.		
9.		4,464,447	8/7/84	Lazzari et al.		
10.		4,465,744	8/14/84	Susman et al.		
11.		4,477,541	10/16/84	Fraioli		
12.		4,512,905	4/23/85	Clearfield et al.		
13.		4,668,595	5/26/87	Yoshino et al.		
14.		4,707,422	11/17/87	de Neufville et al.		
15.		4,792,504	12/20/88	Schwab et al.		
16.		4,828,834	5/9/89	Nagaura et al.		
17.		4,830,939	5/16/89	Lee et al.		
18.		4,935,317	6/19/90	Fauteux et al.		
19.		4,985,317	1/15/91	Adachi et al.		
20.		4,990,413	2/5/91	Lee et al.		
21.	✓	5,037,712	8/6/91	Shackle et al.		

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U.S. PATENT DOCUMENTS

Ref. Desig.	Examiner's Initials	Document Number	Date	Name	Class/ Subclass	(If appropriate) Filing Date
22.	cl	5,130,211	7/14/92	Wilkinson et al.	—	
23.		5,232,794	8/3/93	Krumpelt et al.	—	
24.		5,262,253	11/16/93	Golovin	—	
25.		5,300,373	4/5/94	Shackle	—	
26.		5,336,572	8/9/94	Koksbang	—	
27.		5,399,447	3/21/95	Chaloner-Gill et al.	—	
28.		5,411,820	5/2/95	Chaloner-Gill	—	
29.		5,418,090	5/23/95	Koksbang et al.	—	
30.		5,418,091	5/23/95	Gozdz et al.	—	
31.		5,425,932	6/20/95	Tarascon	—	
32.		5,435,054	7/25/95	Tonder et al.	—	
33.		5,456,000	10/10/95	Gozdz et al.	—	
34.		5,460,904	10/24/95	Gozdz et al.	—	
35.		5,463,179	10/31/95	Chaloner-Gill et al.	—	
36.		5,482,795	1/9/96	Chaloner-Gill	—	
37.		5,514,490	5/7/96	Chen et al.	—	
38.		5,540,741	7/30/96	Gozdz et al.	—	
39.		5,580,430	12/3/96	Balagopal et al.	—	
40.		5,643,695	7/1/97	Barker et al.	—	
41.	✓	5,674,645	10/7/97	Amatucci et al.	—	

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U.S. PATENT DOCUMENTS

Ref. Desig.	Examiner's Initials	Document Number	Date	Name	Class/ Subclass	(If appropriate) Filing Date
42.	cl	5,702,995	12/30/97	Fu	—	
43.	↓	5,910,382	6/8/99	Goodenough et al.	—	
44.	↓	6,004,697	12/21/99	Thackeray et al.	—	
45.	↓	6,153,333	11/28/00	Barker	—	

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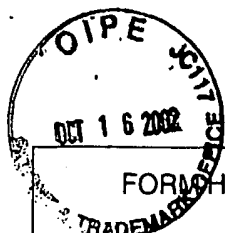
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1.	cl	EP 1 049 182	11/2/00	Europe	—	X	
2.	↓	EP 1 093 172	4/18/01	Europe	—	X	
3.	↓	EP 0 680 106	11/2/95	Europe	—	X	
4.	↓	WO 00/01024	1/6/00	WIPO	—		
5.	↓	WO 98/12761	3/26/98	WIPO	—		
6.	↓	WO 99/30378	6/17/99	WIPO	—		
7.	↓	WO 00/57505	9/28/00	WIPO	—		
8.	↓	JP 61-263069	11/21/86	Japan	—	Abstract	
9.	↓	JP 6-251764	9/9/94	Japan	—	Abstract	

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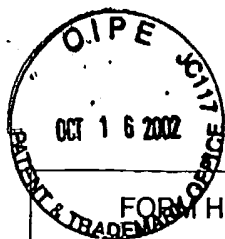
Ref. Desig.	Examiner's Initials	
1.	cl	A. B. Bykov et al., Superionic Conductors $\text{Li}_3\text{M}_2(\text{PO}_4)_3$ ($\text{M}=\text{Fe}, \text{Sc}, \text{Cr}$): Synthesis, Structure and Electrophysical Properties, Solid State Ionics 38 (1990) 31-52.
2.		Rangan et al., New Titanium-Vanadium Phosphates of Nasicon and Langbeinite Structures, and Differences between the Two Structures Toward Deintercalation of Alkali Metal, Journal of Solid State Chemistry 109, 116-121 (1994).
3.		Kirkby et al, Crystal Structure of Potassium Aluminum Fluoride Phosphate, KAIFPO_4 , Department of Chemistry, University of Toronto, Toronto, Ontario, Canada, M5S 1A1.
4.		J. Arlt et al., $\text{Na}_5\text{AlF}_2(\text{PO}_4)_2$: Darstellung, Kristallstruktur und Ionenleitfähigkeit, Z. anorg. allg. Chem. 547 (1987) 179-187.
5.		P G Nagornyi et al., Preparation and Structure of the New Fluoride Phosphate $\text{Na}_5\text{CrF}_2(\text{PO}_4)_2$, Russian Journal of Inorganic Chemistry 35 (4) 1990.
6.		Loiseau et al., $\text{NH}_4\text{FePO}_4\text{F}$: Structural Study and Magnetic Properties, Journal of Solid State Chemistry III, 390-396 (1994).
7.		LeMeins et al., Phase Transitions in the $\text{Na}_3\text{M}_2(\text{PO}_4)_2\text{F}_3$ Family ($\text{M}=\text{Al}^{3+}, \text{V}^{3+}, \text{Cr}^{3+}, \text{Fe}^{3+}, \text{Ga}^{3+}$): Synthesis, Thermal, Structural, and Magnetic Studies, Journal of Solid State Chemistry 148, 260-277 (1999).
8.		Yakubovich et al., Inorganic Compounds: The Mixed Anionic Framework in the Structure of $\text{Na}_2[\text{MnF}(\text{PO}_4)]$, Acta Cryst. (1997) C53, 395-397.
9.		Moss et al., On the X-ray Identification of Amblygonite and Montebrasite, Mineralogical Magazine, September 1969, vol. 37, No. 287.
10.		LeMeins et al., Ionic Conductivity of Crystalline and Amorphous $\text{Na}_3\text{Al}_2(\text{PO}_4)_2\text{F}_3$, Solid State Ionics III (1998) 67-75.
11.		M. Dutreilh et al., Synthesis and Crystal Structure of a New Lithium Nickel Fluorophosphate $\text{Li}_2[\text{NiF}(\text{PO}_4)]$ With an Ordered Mixed Anionic Framework, Journal of Solid State Chemistry 142, 1-5 (1999).
12.		Manthiram et al., Lithium Insertion Into $\text{Fe}_2(\text{SO}_4)_3$ Frameworks, Journal of Power Sources, 26 (1989) 403-408.
13.	✓	Amblygonite Mineral Data; http://webmineral.com/data/Amblygonite.shtml .

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Sheet 5 of 5

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OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.)

Ref. Desig.	Examiner's Initials	
14.	ce	Lacroixite Mineral Data, http://webmineral.com/data/Lacroixite.shtml
15.		Montebrasite Mineral Data, http://webmineral.com/data/Montebrasite.shtml
16.		Tavorite Mineral Data, http://webmineral.com/data/Tavorite.shtml
17.		A. Nadiri et al., Lithium Intercalation in Lithium Titanium Phosphate, C. R. Acad. Sci., Ser. 2 (1987), 304 (9), 415-18 (Abstract Provided).
18.		Genkina et al., Phase Formation and Crystallochemistry of Iron Phosphates Formed Under Hydrothermal Conditions, Izv. Akad. Nauk SSSR, Neorg. Mater. (1988), 24 (7), 1158-62 (Abstract Only).
19.		Genkina et al., Crystal Structure of Synthetic Tavorite (LiFe[PO ₄] (OH,F)), Kristallografiya (1984), 29 (1), 50-5 (Abstract Only).
20.		International Search Report, PCT/US01/08132
21.		Mt. Averbuch-Pouchot et al., "Topics in Phosphate Chemistry", World Scientific 1996.
22.		J. Gopalakrishnan et al., V ₂ (PO ₄) ₃ : A Novel NASICON-Type Vanadium Phosphate Synthesized by Oxidative Deintercalation of Sodium from Na ₃ V ₂ (PO ₄) ₃ , Chem. Mater., Vol. 4, No. 4, 1992, p. 745-747.
23.	✓	International Search Report, PCT/US00/04401 (attached to WO 00/57505)

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	4858-000080USB	
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U.S. PATENT DOCUMENTS

Ref. Desig.	Examiner's Initials	Document Number	Date	Name	Class/ Subclass	(If appropriate) Filing Date
1.	CL	6,153,333	11/28/2000	Barker	—	
2.		5,674,645	10/07/1997	Amatucci et al.	—	
3.		5,514,490	05/07/1996	Chen et al.	—	
4.		4,985,317	01/15/1991	Adachi et al.	—	
5.		4,512,905	04/23/1985	Clearfield et al.	—	
6.		4,049,891	09/20/1977	Hong et al.	—	
7.		4,009,092	02/22/1977	Taylor	—	
8.	↓	3,736,184	05/29/1973	Dey et al.	—	

FOREIGN PATENT DOCUMENTS

Ref. Desig.	Examiner's Initials	Document Number	Date	Country	Class/ Subclass	Translation Yes	No
1.	a	EP 0 680 106 A1	11/02/1995	EPO	—	Yes	
2.	a	JP 61-263069	11/21/1986	JP	—	Abstract	
3.	e	WO 98 12761 A	03/26/1998	US	—	Yes	

OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.)

Ref. Desig.	Examiner's Initials	
1.	CL	International Search Report for PCT/US97/15544; EPO - 01/13/1998
2.	↓	Delmas et al., "The Nasicon-type...Materials"; SSI (1988) 28-30 (419-423)
3.	↓	Hagenmuller et al., "Intercalation in 3-D...Features"; Mat. Res. Soc. Proc., SSI, (1991) 323-34

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Date Considered:

10-16-04

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OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.)		
Ref. Desig.	Examiner's Initials	
4.	<i>cl</i>	Chem. Abstrs. Svs., (1997); XP 2048304
5.		Padhi et al., "Lithium Intercalation into Nasicon-type...and $\text{Li}_2\text{FeTi}(\text{PO}_4)_3$ " 37th Power Sources Conference; Cherry Hill, New Jersey; Conference Date: June 17-20, 1996, published Oct. 15, 1996
6.		J. Gopalakrishnan and K. Kasthuri Rangan, " $\text{V}_2(\text{PO}_4)_3$: A Novel NASICON-Type Vanadium Phosphate Synthesized by Oxidative Deintercalation of Sodium from $\text{Na}_3\text{V}_2(\text{PO}_4)_3$," Chemistry of Materials, Vol. 4, No. 4, 745-747, July/August 1992
7.		K. Kasthuri Rangan and J. Gopalakrishnan, "New Titanium-Vanadium Phosphates of Nasicon and Langbeinite Structures, and Differences Between the Two Structures Toward Deintercalation of Alkali Metal," Journal of Solid State Chemistry, 109, 116-121, 1994
8.		Delmas et al., "The Chemical Short Circuit Method...", Mat. Res. Bull., Vol 23, pp. 65-72 (month not available), 1988
9.		Ivanov-Schitz et al., "Electrical...electrodes"; SSI (Oct 96) 91 (93-99)
10.		Cretin et al., "Study...Sensors", JR. EP. Ceramic Soc., (1995) (Vol. 15, No. 11) (1149-56)
11.		Chem. Abstrs. Svs., (1995) XP 2048305
12.		Patents Abstracts of Japan (1994) Vol. 18, No. 64 (Abstr. for JP 06251764)
13.		Okada et al., " $\text{Fe}_2(\text{SO}_4)_3$ as a Cathode Material for Rechargeable Lithium Batteries", status as publication to be verified; cited by Examiner in SN 08/717,979
14.		Adachi et al., "Lithium Ion Conductive Solid Electrolyte", Chemical Abstracts 112 129692 (1981)
15.		Delmas et al., "A Nasicon-Type Phase as Intercalation Electrode: Sodium Titanium Phosphate ($\text{NaTi}_2(\text{PO}_4)_3$), Mater. Res. Bull. (1987)
16.		Nanjundaswamy et al., "Synthesis, Redox Potential Evaluation and Electrochemical Characteristics of NASICON-Related-3D Framework Compounds", SSI 92 (1996)
17.	<i>↓</i>	K. Kubo et al., "Synthesis and Electrochemical Properties for LiNiO_2 Substituted by Other Elements", Journal of Power Sources 68 (1997), pp. 553-557

Examiner:

Carl Ch...

Date Considered:

10-18-04

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OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.)		
Ref. Desig.	Examiner's Initials	
18.	CC	"Topics in Phosphate Chemistry", M-T Averbuch-Pouchot, A. Durif, World Scientific Publishing Co., Ptc. Ltd.
19.		Padhi et al., "Phospho-Olivines as Positive-Electrode Materials for Rechargeable Lithium Batteries", J. Electrochem. Soc., Vol. 144, No. 4, April 1997, pp. 1188-1194
20.		Search Report for PCT/US00/04401; US - July 31, 2000

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